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Tawhid as the Ethical Foundation for the Development of Science and Technology from an Islamic Educational Perspective

Viona Wulandari[1*], Rahma Aulia[2], Bunga Putri Zazkia[3], Widya Wulandari[4]
[1]Universitas Islam Negeri Raden Fatah, Palembang, Indonesia [2]Universitas Islam Negeri Raden Fatah, Palembang, Indonesia [3]Universitas Islam Negeri Raden Fatah, Palembang, Indonesia [4]Universitas Islam Negeri Raden Fatah, Palembang, Indonesia
*23051070302@radenfatah.ac.id

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ABSTRAK

Penelitian ini dilatarbelakangi oleh permasalahan krisis moral, dehumanisasi, dan kerusakan lingkungan yang muncul akibat perkembangan sains dan teknologi modern yang didasarkan pada paradigma sekuler, yang memisahkan nilai-nilai ketuhanan dari aktivitas ilmiah. Tujuan penelitian ini adalah untuk mengkaji dan merumuskan tauhid sebagai landasan etika bagi pengembangan sains dan teknologi. Pendekatan yang digunakan adalah penelitian kepustakaan (library research) dengan analisis konten deskriptif-interpretatif terhadap literatur primer dan sekunder yang relevan, termasuk kitab tafsir, hadis, serta artikel jurnal tentang etika sains, filsafat teknologi, dan maqāṣid al-sharī'ah. Solusi yang diusulkan adalah integrasi nilai-nilai tauhid, maqāṣid al-sharī'ah, dan tanggung jawab moral ilmuwan ke dalam kebijakan riset dan kurikulum pendidikan. Temuan utama penelitian ini menunjukkan bahwa tauhid berfungsi sebagai kompas moral yang memastikan sains dan teknologi dikembangkan untuk kemaslahatan, keadilan, dan kelestarian alam, serta menghindarkan dari dampak negatif seperti rekayasa genetika tanpa batas, bias algoritmik, dan kerusakan ekosistem. Penelitian ini menyimpulkan bahwa nilai-nilai tauhid yang diterapkan secara sistematis dapat menyelaraskan antara kemajuan material dengan nilai-nilai spiritual, serta mengarahkan ilmuwan pada tanggung jawab kekhalifahan di bumi.
Kata kunci : Tauhid; Teknologi Modern; Integrasi Islam.

ABSTRACT

This study is motivated by the issues of moral crisis, dehumanization, and environmental degradation arising from the development of modern science and technology based on a secular paradigm, which separates divine values from scientific activity. The objective of this study is to examine and formulate Tawhid as an ethical foundation for the development of science and technology. The approach used is library research with descriptive-interpretive content analysis of relevant primary and secondary literature, including tafsir, hadith, and journal articles on the ethics of science, philosophy of technology, and maqaṣid al-shari'ah. The proposed solution is the integration of the values of tauhid, maqaṣid al-shari'ah, and the moral responsibility of scientists into research policies and educational curricula. The main findings of this study indicate that tauhid functions as a moral compass ensuring that science and technology are developed for the common good, justice, and environmental sustainability,

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INTRODUCTION

Advances in modern science and technology have brought about fundamental changes in human life, but they have also given rise to moral crises, dehumanization, and environmental degradation due to a secular paradigm that separates divine values from scientific activity. In the education system and the development of science, there is a dichotomy between religious studies and general science. Consequently, science has lost its moral and spiritual orientation. This is exacerbated by the dominance of instrumental rationality, which prioritizes efficiency without considering long-term moral consequences, as evidenced by advances in biotechnology that threaten human dignity and artificial intelligence that tends toward dishonesty. The development of science and technology grounded in the values of tawhid represents the ideal state envisioned in Islam. In this state, all scientific endeavors are regarded as acts of worship and devotion to Allah and are directed toward the common good. Science does not merely seek empirical truth but also pursues justice, compassion, and

environmental responsibility as manifestations of humanity's stewardship of the Earth.

Nevertheless, reality reveals a clear disparity between the ideal and the actual. The Western secular paradigm is still employed by many educational and research institutions in the Islamic world. This paradigm separates religion from science and treats values as a neutral subject.[1] As a result, technology is often developed without ethical considerations, leading to adverse effects such as unchecked genetic engineering, privacy violations, algorithmic bias, and ecosystem damage. Furthermore, Islamic education in the contemporary era remains hindered by the divide between religious studies and general sciences, which impedes the cultivation of Muslim scholars who are deeply devout, knowledgeable, and of high moral character.

An integrative approach that establishes tawhid as the ethical foundation and paradigm for the development of science and technology is necessary to bridge this gap. The spiritual awareness, ethics, and social responsibility of students and researchers can be enhanced by incorporating the values of tawhid into the curriculum and the scientific process. Furthermore, the perspective of maqāṣid al-sharī'ah which encompasses the preservation of religion, life, intellect, lineage, and property can serve as a foundation for guiding research focused on human welfare and the sustainability of civilization.[2] It is crucial that scientists possess moral responsibility, as they must not only possess technical competence but also moral awareness and an understanding of their stewardship responsibilities.

METHODS

This study is a qualitative library research project aimed at examining Tawhid as the ethical foundation of science and technology. Primary data sources include tafsir texts, hadiths, as well as books and journal articles that directly discuss the integration of tauhid in science and technology, while secondary data sources include books, encyclopedias, and supporting articles related to the ethics of science, the philosophy of technology, and maqasid al-shari'ah. Data collection techniques employ a documentary method through systematic searches in academic databases such as Google Scholar, Scopus, and DOAJ using the keywords "tawhid and science ethics," "integration of Islam and technology," "maqasid al-shari'ah in science," and "scientists' moral responsibility"; source selection was based on direct relevance, author/publisher credibility, and publication within the last decade (except for fundamental classical works). Data analysis was conducted using a descriptive-interpretive content analysis method through three stages: data reduction by summarizing essential information, presentation of data in thematic narratives according to the research questions, and drawing conclusions through verification and synthesis to achieve the research objectives.

RESULTS AND DISCUSSION

1. Tawhid as an Ethical Basis in the Development of Science and Technology

Ethics derives from the Greek word ethos, which means morality or custom. Generally speaking, ethics is defined as the principles that determine how humans should behave properly in their social lives. In society, ethics is the best way to create peace and maintain good relationships. However, from the perspective of monotheism, ethics focuses not only on interpersonal relationships but also on the divine. In fact, ethics is always associated with righteous deeds, sins, rewards, and punishments, as well as heaven and hell. The Qur'an and Sunnah are the foundations of monotheistic ethics because these two sources determine what is right or wrong. Therefore, scientific and technological progress is guided by monotheistic ethics that is, as a means to bring happiness to humanity without harming the universe or others, while maintaining a good relationship with Allah SWT.[3] Tawhid is the cornerstone of life; it is the belief in the oneness of Allah, which fosters moral consciousness and establishes humanity on earth as khalīfah or stewards with a vertical responsibility to God and a horizontal responsibility to fellow human beings and the universe.[4]

Tawhid is not merely the belief that Allah is one, but also serves as a moral foundation for technological and scientific progress. In other words, science and technology must not be developed arbitrarily or without a foundation, because without a moral foundation, science can actually harm nature and humanity. According to tawhid, every scientific discovery must bring about benefit, not harm. Furthermore, the values of Tawhid foster a sense of justice, non-discrimination, the preservation

of human unity, and a sense of responsibility as stewards on Earth to protect the environment. Therefore, when scientists develop technologies such as artificial intelligence or genetic engineering, they must always remember that these are God's creations and must be used for the common good, not for greed or destruction. In other words, Tawhid serves as a moral compass ensuring that science and technology remain aligned with humanity and divine values.[5] Religion must serve as the foundation of science and technology.

Many scientists today adopt a secular paradigm, which separates religion from science, or even a socialist paradigm, which rejects religion entirely. As a result, science and technology are often used for unethical purposes, such as the creation of biological weapons, human cloning, or cybercrime. However, from an Islamic perspective, tawhid is a worldview that asserts that science and technology must be aligned with the Qur'an and the hadith, used for the benefit of humanity, and kept away from harmful practices.[6]

The main problem with science and technology today is that science is developed in isolation from divine or religious values.[7] As a result, even though technology is becoming increasingly advanced, many negative consequences have emerged, such as environmental damage, a loss of humanity, and the use of technology for purposes that harm others.[8] In fact, in Islamic teachings, tawhid the belief that Allah alone is the One and Only should serve as the primary foundation for the advancement of science. Through tawhid, all scientific and technological discoveries are directed toward the common good, the preservation of nature, and the respect for human dignity, rather than merely the pursuit of profit or power.[9]

Based on the above discussion, Tawhid serves as the moral foundation for technology and science. The problem today is that science has developed outside the principles of God, leading to its frequent misuse for harmful purposes such as cloning, biological weapons, or cybercrime that harms both humanity and the environment. Tawhid obligates humanity, as God's vicegerents, to use science for the common good, justice, and the preservation of nature. Therefore, tawhid serves as a moral compass ensuring that technology operates in accordance with divine and humanitarian values.

2. Implications of the Value of Tawhid on the Ethocs of Using Contempory Technology

Modern technologies such as artificial intelligence (AI), genetic engineering, biotechnology, and big data have raised serious ethical challenges, but they have also yielded tremendous benefits.[10] The principle of tawhid the belief in the oneness of God influences how humans use technology. One of the primary consequences is the realization that technology is merely a tool and not an end in itself. In their capacity as servants of God (abd) and stewards on earth, humans are prohibited from using technology for personal gain, to cause harm, or to exploit others. In other words, the human tendency to overstep boundaries when mastering technology is restrained by tauhid.[11] Therefore, the maqāṣid al-sharī'ah must be upheld in every use of technology. The principle of tawhid, for example, demands justice, transparency, and accountability in the use of AI for public decision-making, for Allah is All-Knowing and All-Just. Do not use technology to violate privacy, spread falsehoods, or create discriminatory biases.[12]

A study by Hasanah et al. (2024) found that incorporating the principle of tawhid into artificial intelligence algorithms can reduce bias and enhance consideration for the public interest. According to the principle of tawhid, the universe is a trust from Allah.[13] Therefore, modern technologies such as drones, electric vehicles, or nuclear energy must be used to preserve the environment, not to destroy it. The ethics of using biotechnology and genetic engineering is the fourth issue. According to the principle of tawhid, every human being possesses dignity as a creature of God.[14]

Therefore, genetic engineering for therapeutic purposes is permitted, but reproductive cloning or genetic modification to create a "perfect human" is considered to cross a line because it contradicts human nature and the will of God. Finally, the value of tawhid involves self-monitoring (muraqabah), which means that everyone working in the fields of science and technology is consistently aware of Allah's oversight. Compared to external regulations, this internal safeguard is stronger. Therefore, morality can be upheld when modern technology is used for the benefit of society.[15]

Thus, the principle of tawhid has a profound and significant impact on how we use modern

technology. According to tawhid, technology is merely a means and not an end in itself; therefore, it must be used with an awareness of Allah's oversight and the obligation to uphold the maqāṣid al-sharī'ah, which encompass religion, life, intellect, lineage, and property. The values of tawhid also prohibit genetic engineering that goes beyond human nature and demand justice, transparency, and accountability in the use of artificial intelligence. Furthermore, Tawhid promotes ecological responsibility and self-monitoring (muraqabah), which serve as an internal safeguard stronger than external regulations. Therefore, it is crucial to incorporate the values of Tawhid into every phase of the development and use of modern technology so that technological progress truly benefits humanity and the preservation of nature.

3. Implementation of the Values of Tawhid in Daily Life an Foundation for the Formation of Muslim Character

Incorporating the belief in the oneness of God into every action from intentions and attitudes to habits means applying the principles of tawhid in daily life.[16] This is crucial for building Muslim character because it fosters the awareness that Allah is always watching (muraqabah), so that a person tends to be honest, trustworthy, disciplined, and sincere without relying on the opinions of others. In practice, the principle of tawhid is applied through noble moral practices such as gratitude, patience, tawakal, and mutual aid, as well as the habits of eating and dressing in accordance with religious rules.[17] Studies show that practices rooted in monotheism foster empathy, self-control, and tolerance while preventing radical ideologies.[18] Therefore, families, schools, and the community have a strategic responsibility to instill the values of monotheism from an early age through setting a good example and spiritual guidance. The goal is to raise a generation of Muslims who possess noble character and a sense of social responsibility.[19]

Finally, it has been proven that applying the values of tawhid in daily life provides a strong foundation for building exemplary Muslim character. Because of the awareness that Allah is always watching (muraqabah), people become honest, trustworthy, disciplined, and sincere without relying on the opinions of others. Practicing moral values such as gratitude, patience, tawakal (trust in Allah), and mutual aid, as well as adhering to dietary and dress codes in accordance with Sharia, effectively fosters empathy, self-control, and a tolerant attitude, while simultaneously preventing radicalism. Families, schools, and communities bear a strategic responsibility to instill the values of Tawhid in children through exemplary behavior and spiritual reinforcement. Therefore, a generation of Muslims who are not only intellectually intelligent but also morally and spiritually strong, and socially responsible, will emerge through the consistent internalization of Tawhid in every aspect of life.

CONCLUSION

This study found that the values of tawhid can serve as a strong moral foundation for the advancement of contemporary science and technology. Key findings indicate that tawhid is not merely a theological belief but also a moral compass that guides scientific research toward justice, the common good, and environmental sustainability. These values also prevent adverse effects such as unrestrained genetic engineering, algorithmic bias, and ecosystem damage. Regarding the ethics of modern technology use, the values of tauhid demonstrate that technology is merely a tool that must be used with an awareness of Allah's oversight (muraqabah), upholding the maqāṣid al-sharī'ah, and opposing all forms of exploitation and violation. Furthermore, it has been proven that the application of the values of tawhid in daily life shapes the character of Muslims to be honest, trustworthy, tolerant, and responsible toward society. Furthermore, it has been proven that the application of the values of tawhid in daily life fosters a Muslim character that is honest, trustworthy, tolerant, and responsible toward society. Therefore, the research hypothesis stating that the values of tawhid can be systematically applied in research policies and scientific ethics can mitigate the negative effects of contemporary technology and harmonize material progress with spiritual progress.

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